CLAIMS

1. A seamless device for detecting the presence of an analyte in a sample, comprising:

(a) a core comprising:

(i) a binding substrate with a binding site for the analyte;

(ii) at least one analogue that binds in the binding site and that has a label with a first emission wavelength; and

(iii) a quenching dye;

(iv) a void volume;

(b) a reference with a different emission wavelength than the label; and

(c) an analyte-permeable membrane that encapsulates components (a) and (b) and that is transparent to light of the wavelengths that excite the label and the reference.

2. The device of claim 1, wherein said quenching dye absorbs said first emission wavelength.

3. The device of claim 1, wherein said quenching dye absorbs an excitation wavelength.

4. The device of claim 1, wherein said analyte-permeable membrane is treated with a biocompatibility enhancer, selected from the group consisting of polyethylene glycol, polysilicones, parylene, or angiogenic materials.

5. The device of claim 1, wherein said reference is covalently bonded to the interior or exterior surface of the analyte-permeable membrane.

6. The device of claim 1, wherein said reference is in the analyte-permeable membrane.

7. The device of claim 1, wherein said reference is in the void volume.

8. The device of claim 1, wherein said reference is in the core.

9. The device of claim 1, wherein the binding substrate has an inherent affinity for the analyte.

10. The device of claim 1, wherein a molecule having an affinity for the analyte is linked to the binding substrate.

11. The device of claim 1, wherein said binding substrate is selected from the group consisting of dextran, glycogens, yeast mannans, amylopectins, levans, globulin, proteins, hormones, antibodies, thyroxin binding globulin, actin, and tubulin.

12. The device of claim 1, wherein the binding substrate is cross-linked dextran.

13. The device of claim 1, wherein the binding substrate is immobilized in a binder.

14. The device of claim 13, wherein said binder is selected from the group consisting of hydrogels, silicone containing polymers, polysulfones, polyacrylamides, epoxies, and combinations thereof.

15. The device of claim 13, wherein said binder is cross-linked polyacrylamide.

16. The device of claim 13, wherein said binder contains the quenching dye.

17. The device of claim 1, wherein said binding substrate contains the quenching dye.

18. The device of claim 1, wherein the binding substrate has a molecular imprint of the analyte.

19. The device of claim 1, wherein the void volume surrounds the binding substrate.

20. The device of claim 1, wherein the binding substrate surrounds at least part of the void volume.

21. The device of claim 1, wherein said quenching dye is selected from the group consisting of an Alkali Blue, Safranin, and Pararosaniline.

22. The device of claim 1, wherein the dye is an Alkali blue.

23. The device of claim 1, wherein the analogue is a glucose analogue.

24. The device of claim 1, wherein said analogue is selected from the group consisting of lectins, Concanavalin-A, wheat germ agglutinin, and soybean agglutinin.

25. The device of claim 1, wherein the analogue is Concanavalin-A.

26. The device of claim 1, wherein said label is an organic dye.

27. The device of claim 1, wherein said label is selected from the group consisting of cyanine dyes, ALEXA-488, and ALEXA-633.

28. The device of claim 1, wherein said label is ALEXA-633.

29. The device of claim 1, wherein said label is covalently bonded to said analogue.

30. The device of claim 1, wherein the reference is a quantum dot.

31. The device of claim 1, wherein the reference is an organic dye.

32. The device of claim 1, wherein said reference is selected from the group consisting of cyanine dyes and phycobiliproteins.

33. The device of claim 1, wherein the reference is Cy-5.

34. The device of claim 1, wherein said analyte-permeable membrane is selected from the group consisting of cellulose acetate, polysulfones (UDEL), polycarbonates, poly(vinyl chlorides), polyamides, ethylene vinyl acetate copolymers, poly(vinylidene) fluoride, poly(urethanes), poly(benzimidazoles), cellulose esters, cellulose triacetate, cellulose, cellulose nitrate, regenerated cellulose, cross-linked poly(vinylpyrrolidone), cross-linked polyacrylamide, cross-linked poly (hydroxy ethyl methacrylate), polyurethanes, polyureas, hydrogels, silicon-containing polymers, polyethers, acrylics, P-HEMA, nafion, and glutaraldehyde, or mixtures thereof.

35. The device of claim 1, wherein the analyte-permeable membrane is made from cellulose acetate or a polysulfone.

36. The device of claim 1, wherein the analyte-permeable membrane is made from cellulose acetate.

37. The device of claim 1, wherein said analyte-permeable membrane further comprises magnetic or metallic particles.

38. The device of claim 1, wherein said analyte is selected from the group consisting of glucose, thyroxin, coumadin, synthroid, cyclosporin, erythropoietin, lopid, monopril, digoxin, amiodarone, prothrombin, cytokines, chemokines, creatinine, lactate, taxol, and fluorouracil.

39. The device of claim 1, wherein said analyte is glucose.

40. The device of claim 1, wherein a ratio of the void volume to a volume occupied by the binding substrate is between about 0.05 and about 5, inclusive.

41. The device of claim 40, wherein the ratio is between about 0.5 and about 3, inclusive.

42. The device of claim 40, wherein the ratio is about 1.

43. The device of claim 1, wherein a weight ratio of the analogue to the binding substrate is about 0.1 to about 10.

44. A method of detecting the presence of one or more analytes in a sample in vivo, comprising:

(i) implanting in a living organism in fluid contact with a biological fluid a device comprising at least one device of claim 1;

(ii) irradiating the device with light, and

(iii) detecting light emitted from the device.

45. The method of claim 44, wherein the device is implanted in the skin.

46. The method of claim 44, wherein irradiating is performed with a laser.

47. The method of claim 44, wherein irradiating is performed with a laser that emits in the infrared band.